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(71)Applicant : FUJI PHOTO FILM CO LTD

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(72)Inventor : YAMAGUCHI HIROSHI

(54) IMAGE PROCESSING UNIT

(57)Abstract-

PROBLEM TO BE SOLVED: To stably reproduce a picture in the case of reprint by setting processing through the use of the picture data of a picture that are supplied and storing the processed picture information to a storage means in a 1st processing mode, retrieving the storage means, reading corresponding picture information and setting the picture processing in a 2nd processing mode.

SOLUTION: In the 1st processing mode, a setup section 70 generates a density histogram from preliminary scanning data, calculates picture characteristics values such as the mean density, prescribed percentage points of the frequency of the density histogram like a highlight points and shadow points, and the maximum and a minimum value of the histogram, and sets the read condition of the main scanning. In the 2nd processing and 3rd processing modes, the read condition of the main scanning is set by conducting generation of the density histogram and calculation of the image feature values, and a retrieval means 80 uses picture information from a storage means 78 to reproduce processing in a main scanning processing section 56 and supplies the result to a parameter integration section 76.

LEGAL STATUS

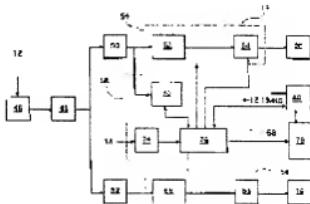
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CLAIMS

[Claim(s)]

[Claim 1] A storage means to be the image processing system which processes an image and is used as an output image, and to memorize the image information relevant to the processed image. Have a selection means to choose the 1st processing mode and the 2nd processing mode, and it sets to said 1st processing mode. While setting up processing using the image data of the supplied image, memorize the image information of the processed image for said storage means, and it sets to said 2nd processing mode. The image processing system characterized by reading the image information which searches said storage means and corresponds, and setting up processing of an image using this image information.

[Claim 2] The image processing system according to claim 1 which carries out the overwrite storage of the image information according to correction directions at said storage means, or memorizes the image information according to correction directions, and deletes the last image information in said 2nd processing mode when there are correction directions of processing.

[Claim 3] A storage means to be the image processing system which processes an image and is used as an output image, and to memorize the image information relevant to the processed image. Have a selection means to choose the 1st processing mode, the 2nd processing mode, and the 3rd processing mode, and it sets to said 1st processing mode. While setting up processing using the image data of the supplied image, memorize the image information of the processed image for said storage means, and it sets to said 2nd processing mode. While reading the image information which searches said storage means and corresponds and setting up processing of an image from this image information, do not make a change of the image information of said storage means, but it sets to said 3rd processing mode. The image processing system which carries out the overwrite storage of the image information new for said storage means, or is characterized by deleting the last image information and memorizing new image information while reading the image information which searches said storage means and corresponds and setting up processing of an image using this image information.

[Claim 4] The image processing system according to claim 3 with which at least one of the retrieval range at the time of searching said storage means with said 2nd processing mode and 3rd processing mode and the retrieval parameters differ.

[Claim 5] A storage means to be the image processing system which processes an image and is used as an output image, and to memorize the image information relevant to the processed image. A read-out directions means to direct read-out of image information, and a retrieval means to search said storage means according to directions by the aforementioned read-out directions means. When it has the storage directions means of image information which becomes effective when the image information which corresponds with said retrieval means is searched and there are no directions by the aforementioned read-out directions means While setting up processing using the image data of the supplied image, when it memorizes the image information of the processed image for said storage means and there are directions by the aforementioned read-out directions means The image processing system characterized by memorizing the image information of the image processed based on directions by said storage directions means for said storage means while setting up processing using the image information which said retrieval

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention belongs to the technical field of the print system which outputs the print (photograph) reproducing the image photoed by the film or the image photoed with the digital camera, and relates to the image processing system which makes it possible to make the image of a coincidence print and a reprint suitably in agreement in such a print system in detail.

[0002]

[Description of the Prior Art] The so-called direct exposure of baking to the sensitive material (printing paper) of the image photoed by photographic films (it considers as a film hereafter), such as current, a negative film, and a reversal film, which projects the image of a film on sensitive material and exposes it is in use.

[0003] On the other hand, in recent years, the printing equipment using digital exposure, i.e., the image recorded on the film, was read in photoelectricity, and after making the read image into a digital signal, various image processings were performed and it considered as the image data for record, and scan exposure of the sensitive material was carried out by the record light modulated according to this image data, the image (latent image) was recorded, and the digital photograph printer considered as a print (workmanship) was put in practical use.

[0004] Fundamentally a digital photograph printer by carrying out incidence of the reading light to a film, and reading the projection light The scanner which reads in photoelectricity the image recorded on the film (image reader), The image processing system which performs predetermined processing to the image data supplied from the image data read with the scanner, a digital camera, etc., and is made into the image data, i.e., the exposure conditions, for image recording. The printer which carries out scan exposure of the sensitive material, and records a latent image by light beam scan, corresponding to the image data outputted from the image processing system (image recording equipment). A development is performed to the sensitive material exposed by the printer, and it has the processor (developer) considered as the print (workmanship) with which the image was reproduced, and is constituted.

[0005] According to such a digital photograph printer, a jump of the image which originates an image in a backlight, speed light photography, etc. since processing of image data can adjust an image as digital image data, amendment of TSUBURE, sharpness (sharp-izing) processing, etc. are performed suitably, and the high-definition print which was not obtained can be obtained by the conventional direct exposure. And according to the digital photograph printer, the image photoed with the digital camera etc. can also be outputted as a print.

[0006]

[Problem(s) to be Solved by the Invention] By the way, the so-called reprint which outputs again the image photoed by not only a digital photograph printer such but the film and the image (coma) printed once on the print outputted from the image data photoed with the digital camera according to the request of an extra copy etc. as a print is performed in many cases. In this case, when there are especially no correction directions, it is with the print (print usually outputted on the occasion of a coincidence print) outputted previously, and a reprint, and it is

required that the reproduced image should be in agreement. However, also when a previous print and a reprint change in the color and concentration of an image with decision of an operator, differences in actuation, etc., it is plentifully, and there are also many complaints from a customer.

[0007] Moreover, although the rehash which outputs that print is again performed when un-fitness [the print outputted previously], to be also able to perform this rehash at good workability and effectiveness is desired.

[0008] In the print system which outputs the print reproducing the image photoed with the image which the purpose of this invention has in solving the trouble of said conventional technique, and was photoed by the photographic film, the digital camera, etc. On the re-order print according to a request of an extra copy etc. It is in offering the image processing system with which it is stabilized, and can reappear and a rehash when un-fitness [a previous print] can also perform the image of the last print, and an image (congruous images) with same color and concentration by good workability.

[0009]

[Means for Solving the Problem] A storage means for this invention to be an image processing system which processes an image and is used as an output image, and to memorize the image information relevant to the processed image in order to attain said purpose. Have a selection means to choose the 1st processing mode and the 2nd processing mode, and it sets to said 1st processing mode. While setting up processing using the image data of the supplied image, memorize the image information of the processed image for said storage means, and it sets to said 2nd processing mode. The image information which searches said storage means and corresponds is read, and the image processing system characterized by setting up processing of an image using this image information is offered.

[0010] Moreover, in said 2nd processing mode, when there are correction directions of processing, it is desirable to carry out the overwrite storage of the image information according to correction directions at said storage means, or to memorize the image information according to correction directions, and to delete the last image information.

[0011] Moreover, a storage means for another mode of this invention to be an image processing system which processes an image and is used as an output image, and to memorize the image information relevant to the processed image. Have a selection means to choose the 1st processing mode, the 2nd processing mode, and the 3rd processing mode, and it sets to said 1st processing mode. While setting up processing using the image data of the supplied image, memorize the image information of the processed image for said storage means, and it sets to said 2nd processing mode. While reading the image information which searches said storage means and corresponds and setting up processing of an image from this image information, do not make a change of the image information of said storage means, but it sets to said 3rd processing mode. While reading the image information which searches said storage means and corresponds and setting up processing of an image using this image information, the image processing system which carries out the overwrite storage of the image information new for said storage means, or is characterized by deleting the last image information and memorizing new image information is offered.

[0012] Moreover, it is desirable that at least one of the retrieval range at the time of searching said storage means with said 2nd processing mode and 3rd processing mode and the retrieval parameters differ.

[0013] Furthermore a storage means for another mode of this invention to be an image processing system which processes an image and is used as an output image, and to memorize the image information relevant to the processed image. A read-out directions means to direct read-out of image information, and a retrieval means to search said storage means according to directions by the aforementioned read-out directions means. When it has the storage directions means of image information which becomes effective when the image information which corresponds with said retrieval means is searched, and there are no directions by the aforementioned read-out directions means While setting up processing using the image data of the supplied image, when it memorizes the image information of the processed image for said

storage means and there are directions by the aforementioned read-out directions means While setting up processing using the image information which said retrieval means read, the image processing system characterized by memorizing the image information of the image processed based on directions by said storage directions means for said storage means is offered.

[0014]

[Embodiment of the Invention] Hereafter, the image processing system of this invention is explained to a detail based on the suitable example shown in an attached drawing.

[0015] The block diagram of an example of a digital photograph printer which uses the image processing system of this invention for drawing 1 is shown. In addition, the image processing system of this invention is available suitable not only for such a digital photograph printer but the photograph printer (analog photograph printer) of the conventional direct exposure which burns printing paper by the projection light of a film. That is, the images which the image processing system of this invention processes may be various kinds of image data obtained by reading an image (a photography scene being included) in photoelectricity, and may be subject-copy images (the projection light and reflected light) photoed by the film etc.

[0016] The digital photograph printer (it considers as the photograph printer 10 hereafter) shown in drawing 1 The scanner 12 which reads fundamentally the image photoed by Film F in photoelectricity (image reader), The image processing system 14 which processes the read image data (image information), and considers as the image data for an output, and performs actuation, control, etc. of the photograph printer 10 whole, It has the printer 16 which carries out image exposure, carries out the development of the sensitive material (printing paper), and is outputted as a print (workmanship), and consists of light beams modulated according to the image data outputted from the image processing system 14. Moreover, the display 20 which displays the image read with the scanner 12, various kinds of operator guidance, setup/registration screen of conditions, etc. as the actuation system 18 which has keyboard 18a and mouse 18b for inputting directions of selection in the mode, directions of processing, a color / concentration amendment, etc., etc. is connected to an image processing system 14.

[0017] A scanner 12 is equipment which reads in photoelectricity the image photoed by Film F etc. The light source 22, a variable aperture 24, and the diffusion box 28 that makes homogeneity reading light which carries out incidence to Film F in the direction of a field of Film F. It has the image formation lens unit 32, the image sensors 34 which have the Rhine CCD sensor corresponding to each image reading of R (red), G (green), and B (blue), amplifier (amplifier) 36, and the A/D (analog to digital) converter 38, and is constituted.

[0018] Moreover, in the photograph printer 10, the carrier 30 of dedication is prepared for each according to the film F with which reading, such as 135 sizes and an advanced photo system (Advanced Photo System), is presented. These carriers 30 are constituted free [wearing on the body of a scanner 12], and can respond to various kinds of films or processing by exchanging a carrier 30. The image (coma) with which is photoed by the film and print creation is presented is conveyed by the predetermined reading station with this carrier 30.

[0019] In case the image photoed by Film F is read in such a scanner 12, it is injected from the light source 22, and when the reading light quantity of light adjustment was carried out [light] by the variable aperture 24 carries out incidence to the film F located in the predetermined reading station and penetrates with a carrier 30, the projection light which supports the image photoed by Film F is obtained.

[0020] A carrier 30 has the mask 40 which has conveyance roller pair 30a arranged on both sides of a predetermined reading station and 30b, and slit 40a located corresponding to the reading station which regulates the projection light of Film F in the shape of [predetermined] a slit, as shown in drawing 2 (A). Slit 40a extends in the Rhine CCD sensor and this direction (main scanning direction), and they convey the longitudinal direction of Film F in accordance with the direction of vertical scanning which intersects perpendicularly with a main scanning direction, conveyance roller pair 30a and 30b being located in a reading station in Film F. Incidence of the film F is carried out in reading light, being located in a reading station and conveyed in the direction of vertical scanning by this carrier 30. Thereby, as a result, slit scanning is carried out two-dimensional by slit 40a to which Film F extends in a main scanning direction, and the image

of each coma photoed by Film F is read.

[0021] The magnetic-recording medium is formed in the film of an advanced photo system, and the magnetic head 42 which performs reading/record of the information on this magnetic-recording medium is arranged at the carrier 30 corresponding to the film (cartridge) of an advanced photo system. By various kinds of information, such as the film ID which is the delimiter of a proper, a coma number, and photography time, being recorded on the magnetic-recording medium of the film of an advanced photo system by the film, such information is read by the magnetic head 42 at the time of conveyance of Film F, and is sent to the predetermined part of image processing system 14 grade, and various kinds of information is transmitted to a carrier 30, and it is recorded on the magnetic-recording medium of Film F.

[0022] Moreover, the code reader 44 for reading bar codes, such as the DX code optically recorded on Film F by the carrier 30, the extended DX code, and the FNS code, and various kinds of information optically recorded on the film is arranged. By reading these codes, various kinds of information, such as a film kind and a coma number, is detectable. Various kinds of information read by the code reader 44 is sent to the predetermined part of image processing system 14 grade.

[0023] As mentioned above, reading light turns into projection light which penetrates the film F held at the carrier 30, and supports an image, and image formation of this projection light is carried out to the light-receiving side of image sensors 34 by the image formation lens unit 32. As shown in drawing 2 (B), image sensors 34 are the so-called color CCD sensors of three lines which have Rhine CCD sensor 34B which reads Rhine CCD sensor 34G which read Rhine CCD sensor 34R which reads R image, and G image, and B image, and extend in a main scanning direction. By image sensors 34, it is decomposed into the three primary colors of R, G, and B, and the projection light of Film F is read in photoelectricity. It is sent to an image processing system 14, the output signal of image sensors 34 being amplified with amplifier 36, and being used as a digital signal with A/D converter 38.

[0024] In a scanner 12, it carries out by two image reading by the press can which reads reading of the image photoed by Film F with a low resolution, and this scan for obtaining the image data of an output image. A press can is performed on the reading conditions of a press can that the scanner 12 was set up so that the image of all the target films could be read without saturating image sensors 34. On the other hand, this scan is performed on the reading conditions of this scan set up for every coma so that image sensors 34 may be saturated with concentration [a little] lower than the least concentration of the image (coma) from press can data. Therefore, the output signals of a press can and this scan of the same image differ in resolution and an output level.

[0025] In addition, in this invention, limitation is not carried out to what twists a scanner to such slit scanning, but the field exposure which reads the whole surface of the image of one coma at once may be used. In this case, what is necessary is to decompose into the three primary colors and just to perform the image photoed by the film one by one by establishing the insertion means of each color filter of R, G, and B between the light source and Film F, carrying out sequential insertion of each color filter for example, using an area CCD sensor, and reading an image by the area CCD sensor.

[0026] As mentioned above, the output signal (image data) from a scanner 12 is outputted to the image processing system 14 concerning this invention. The image processing system 14 of this invention in addition, besides the image of the film F read with the scanner 12 Image pickup devices, such as the image reader and digital camera which read the image of a reflection copy, and a digital camcorder. Means of communications, such as LAN (Local Area Network) and a computer communication network, Processing as shows various kinds of image data sources of supply to image data, such as various kinds of image reading means and image pick-up means, such as media (record medium), such as a memory card, MO (magneto-optic-recording medium), and photo CD, and an image data storage means, to reception and the following may be performed.

[0027] The block diagram of an image processing system 14 is shown in drawing 3. As shown in drawing 3, an image processing system 14 (it considers as a processor 14 hereafter) has the

data-processing section 46, the Log converter 48, the press can (frame) memory 50, this scanning (frame) memory 52, the press can processing section 54, this scanning-and-processing section 56, and the conditioning section 58, and is constituted. Moreover, the storage means 78 and the retrieval means 80 are connected to the conditioning section 58 (parameter integrated section 76 mentioned later). Drawing 3 is what mainly shows an image-processing-related part. In addition, to an image processing system 14 CPU which performs control and management of the photograph printer 10 whole which contains a processor 14 besides this, The memory which memorizes information required for actuation of the photograph printer 10 etc., a means to determine the drawing value of a variable aperture 24 and the storage time of the CCD sensor 34, etc. are arranged, and the actuation system 18 and a display 20 are connected at least to each part through this CPU (CPU bus) etc.

[0028] Such processors 14 are mainly the 1st processing mode corresponding to a coincidence print, and the mode corresponding to a reprint as an example, mainly have three processing modes of the 2nd processing mode corresponding to a re-order print, and the 3rd processing mode corresponding to a rehash of a print, and process image data according to the selected mode (processing of an image). In addition, there is especially no limitation in the selection approach of a processing mode, and it should just use well-known approaches, such as GUI (graphical user interface) using the input, the display 20, and mouse 18b by keyboard 18a, for it.

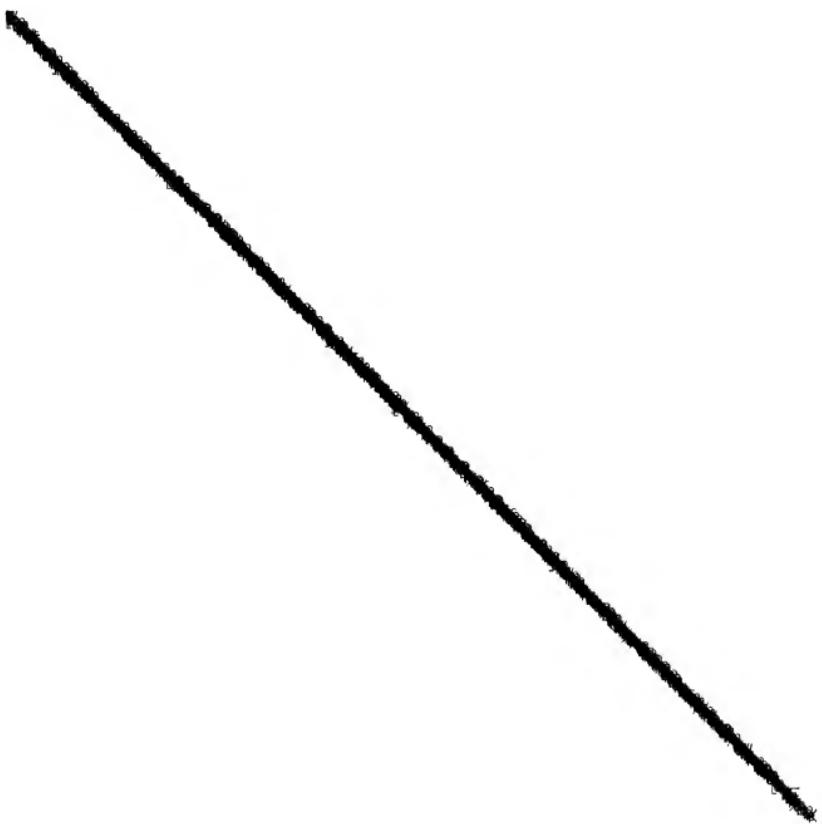
[0029] First, predetermined processing of amendment, a shading compensation, etc. is performed to each output signal of R, G, and B which were outputted from the scanner 12 at the time of DC offset amendment and dark, it is changed by the Log transducer 48 in the data-processing section 46, and is made into digital image data, press can (image) data are used as the press can memory 50, and these scanning (image) data are memorized by this scanning memory 52, respectively (storing).

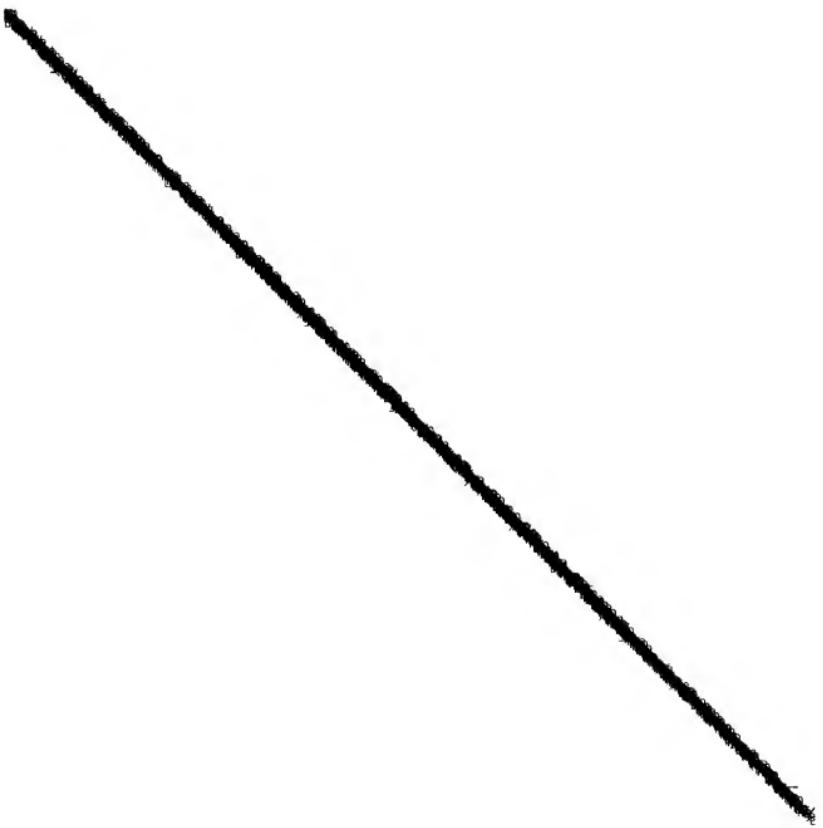
[0030] The press can data memorized by the press can memory 50 are processed in the press can processing section 54, and it considers as the image data corresponding to the display on a display 20, and these scanning data memorized by this scanning memory 52 are processed in this scanning-and-processing section 56, and let them be the image data corresponding to the output by the printer 16. The press can processing section 54 has the image-processing section 62 and the signal transformation section 64, and is constituted. On the other hand, this scanning-and-processing section 56 has the image-processing section 66 and the signal transformation section 68, and is constituted.

[0031] Both the image-processing section 62 (it considers as the processing section 62 hereafter) of the press can processing section 54 and the image-processing section 66 (it considers as the processing section 66 hereafter) of this scanning-and-processing section 56 are parts which perform an image processing to the image (image data) read with the scanner 12 according to a setup of the conditioning section 58 explained in full detail behind. Both perform same processing fundamentally, except that the pixel consistencies of the image data to process differ.

[0032] The image processing in the processing section 62 and the processing section 66 They are various kinds of well-known image processings. As an example Gray balance adjustment, Gradation adjustment, concentration adjustment, electronic variable power processing, sharpness (sharpizing) processing. One or more [such as special finishing of granular control processing, cover baking processing (grant of the cover baking effectiveness in the photograph printer of direct exposure by the image data compression which maintained middle gradation), geometrical distorted amendment, the amount amendment of ambient light, bloodshot-eyes amendment, soft focus, monochrome finishing, etc., etc.,] is illustrated.

[0033] These processings of each are performed that what is necessary is just to carry out by the well-known approach, combining suitably a processing operation (algorithm), processing by the adder or the subtractor, processing by LUT (look-up table), a matrix (MTX) operation, processing with a filter, etc. If an example is given, the approach the approach the approach using LUT by which gray balance adjustment, concentration adjustment, and gradation adjustment are created according to image characteristic quantity performs saturation adjustment using a MTX operation adds the brightness information acquired by sharpness





conditions (a parameter and associated data are included) in the class of image processing which is the information for reproducing the processing performed to the coma at the time of the 1st processing mode, for example, was performed on the occasion of processing by the 2nd processing mode and the 3rd processing mode, the sequence of an image processing, and the performed image processing etc. The multiplier applied to LUT created for the image processing, or operation expression and the image processing defined beforehand that image-processing conditions should just be the information which can reproduce the image processing in the case of the 1st processing mode is illustrated. For example, what is necessary is just to memorize a multiplier by the image processing which processes by LUT like gray balance adjustment, respectively by the image processing which processes by the MTX operation like saturation amendment of LUT, if it is the processing which sets up by the multiplier (gain) like sharpness processing of MTX operation expression.

[0048] Moreover, the image data processed in this scanning-and-processing section 56, its compression image, etc. are available as image-processing information. These can be used also as retrieval information.

[0049] In addition, there is especially no limitation in a storage means 78 to memorize image information, and various kinds of means are available. For example, various kinds of record media, such as a hard disk built in or connected to a processor 14, a database and a floppy disk, and a magneto-optic-recording medium, are illustrated. Moreover, the photograph printer 10 may be connected with an external database by means of communications, such as a computer communication network. When making a record medium into the storage means 78, a lab contractor may manage a medium, it may be passed to a customer and you may have it offered in the case of a reprint.

[0050] The retrieval means 80 acquires the above-mentioned retrieval information, searches the storage means 78, reads the image-processing information on a coma that it corresponds, in the case of processing by the 2nd processing mode and the 3rd processing mode, and sends it to the parameter integrated section 76 at it. This point is explained in full detail behind.

[0051] As mentioned above, the image data from which the image data processed in the press can processing section 54 of a processor 14 was processed by the display 20 in this scanning-and-processing section 56 is sent to a printer 16, respectively. A printer 16 has the printer (printing equipment) which exposes sensitive material (printing paper) according to the supplied image data, and records a latent image, and the processor (developer) which performs predetermined processing to sensitive material [finishing / exposure], and is outputted to it as a print, and is constituted. By recording a back print, and conveying sensitive material by the printer, in the direction of vertical scanning which intersects perpendicularly with a main scanning direction, for example, while becoming irregular according to the image data outputted from the processor 14 and deflecting three sorts of light beams, R exposure, G exposure, and B exposure, to a main scanning direction subsequently after cutting sensitive material to print length, scan exposure of the sensitive material is carried out two-dimensional, a latent image is recorded, and a processor is supplied. The processor which received sensitive material performs predetermined wet-developing processing of the color development, bleaching fixing, rinsing, etc. dries, considers as a print, and is classified and accumulated on predetermined units, such as film 1 duty.

[0052] Hereafter, by explaining an operation of the photograph printer 10 explains the image processing system of this invention to a detail more.

[0053] First, processing by the 1st processing mode is explained with reference to drawing 4 (A). The 1st processing mode is the mode chosen when processing the coma (film F) for the first time by the photograph printer 10 (lab), namely, is mainly the mode corresponding to a coincidence print as mentioned above.

[0054] An operator directs print creation initiation, after performing wearing on the scanner 12 of the carrier according to Film F, set of the film F to a carrier 30, selection of the 1st processing mode, print size to create, and various kinds of required directions and information for an input etc. The image which slit scanning of the film F was carried out [in / the drawing value of the variable aperture 24 of a scanner 12 etc. is set up corresponding to the reading conditions of a

press can by this, and after that and a carrier 30 convey Film F in the direction of vertical scanning at the rate of a press can and / the reading station predetermined as mentioned above], and projection light carried out image formation to image sensors 34, and was photoed by Film F is disassembled into R, G, and B, and it is read in photoelectricity. Moreover, in the case of conveyance of the film by the carrier 30, the DX code and the magnetic information which were recorded on Film F are read, and it is sent to a processor 14. By the above actuation, the parameter integrated section 76 section acquires retrieval information, such as Film ID, a film kind, and a coma number, from the information on the carrier with which it was equipped, magnetic information, or the reading result of the DX code.

[0055] In addition, as a line, a press can and this scan are good, and may give every [predetermined two or more coma / all coma or] and a continuation target one coma of press cans and these scans at a time. The following examples explain the case where this scan is performed to an example, after ending the press can of all coma.

[0056] After it is sent to a processor 14, the output from image sensors 34 being amplified with amplifier 36, and being used as a digital signal with A/D converter 38 and predetermined processing of offset amendment etc. is performed to it in the data-processing section 46, it is changed by the Log transducer 48, is made into digital image data, and is memorized by the press can memory 50.

[0057] This will be read, the image field for every coma will be started, and if press can data are memorized by the press can memory 50, still as mentioned above, for every coma, one by one, creation of a gray level histogram and calculation of image characteristic quantity are performed, and from the result, the setup section 70 will set up the reading conditions of this scan of each coma, such as a drawing value of a variable aperture 24, and will send to a scanner 12. When the image data of the number of predetermined coma gathers, according to directions by the gray level histogram and image characteristic quantity, and the operator etc., for every coma, the setup section 70 chooses the image processing to perform, determines the sequence, computes the image-processing conditions (signal transformation conditions) of each image processing (automatic amendment), and performs generation of a compression image or an infanticide image etc. further if needed. The image-processing conditions and image characteristic value which were set up are sent to the parameter integrated section 76. Moreover, the parameter integrated section 76 sets the set-up image-processing conditions as the predetermined location of the press can processing section 54 and this scanning-and-processing section 56

[0058] If image-processing conditions are set as the press can processing section 54, press can data will be read from the press can memory 50. An image processing is carried out according to the image-processing conditions to which the image field of each coma was started and set in the processing section 62. Subsequently The signal transformation section 64 is supplied, it is changed into the image data according to a display on a display 20, and the press can image of each coma is displayed on a display 20 as a simulation image. In addition, every [one every coma or / two or more coma] are sufficient as a display.

[0059] An operator looks at the display of a display 20, one by one, checks an image (assay) and performs one coma of adjustments of a color, concentration, gradation, etc. etc. at a time using the adjustment key set as keyboard 18a if needed (manual amendment). The signal of adjustment is sent to the key amendment section 74. The key amendment section 74 computes the amount of amendments of the image-processing conditions according to an input, and sends this to the parameter integrated section 76. The parameter integrated section 76 amends the image-processing conditions set as the processing section 62 and the processing section 66 according to the sent amount of amendments. Therefore, the image displayed on a display 20 also changes according to the input by the operator.

[0060] If the image displayed on a display 20 is proper and an operator will judge (assay O.K.), he will perform output directions using keyboard 18a etc. Thereby, the processing performed to the coma (image) is decided.

[0061] If it will be in the condition in which this scan is possible according to termination of a press can, and advance of assay, this scan is started, and while being adjusted to the reading conditions of this scan of 1 coma eye that the drawing value of a variable aperture 24 etc. was

set up in the scanner 12, Film F will be conveyed at the rate of this scan of a carrier 30. In addition, when not authorizing, when a setup of the image-processing conditions to this scanning-and-processing section 56 by the parameter integrated section 76 is ended, it considers as assay termination, and this scan is started. As for the existence of assay, it is desirable to make it selectable as the mode. Moreover, after a press can is completed, as long as initiation of this scan is attained according to decision of reading conditions etc., this scan may be started without waiting for output directions, and you may memorize in this scanning memory 52 as these scanning data.

[0062] This scan is performed like a press can except reading conditions turning into reading conditions of this scan set as that for every coma, and the output signal of image sensors 34 is processed with amplifier 36 and A/D converter 38, is processed in the data-processing section 48 of a processor 14, is used as these scanning data by the Log transducer 50, and is sent to this scanning memory 52. If these scanning data are sent to this scanning memory 52, it will be read by this scanning-and-processing section 58, and the image field of each coma will be started, an image processing is carried out on the image-processing conditions decided for every coma in the processing section 66, subsequently, it is changed in the signal transformation section 68, considers as the image data for an output, and is outputted to a printer 16, and the print which reproduced this image data is created.

[0063] Furthermore, the parameter integrated section 76 matches the predetermined image information (retrieval information and image-processing information) of each coma, and the storage means 78 is made to send and memorize it according to output directions.

[0064] Subsequently, the 2nd processing mode is explained with reference to drawing 4 (B). The 2nd processing mode is the mode corresponding to a re-order of the so-called print which mainly outputs the completely same image as the point among the reprints which process again the coma already processed by the 1st processing mode in the photograph printer 10. Like the 1st previous processing mode, an operator directs print creation initiation, after performing wearing on the scanner 12 of the carrier according to Film F, set of the film F to a carrier 30, selection of the 2nd processing mode, print size to create, and various kinds of required directions and information for an input etc.

[0065] By directions of this initiation, a carrier 30 starts conveyance of Film F and a sequential press can is performed from 1 coma eye. A press can is performed like the 1st processing mode, the basis of the reading conditions of a press can and the projection light of Film F carry out image formation to image sensors 34, and an output signal is amplified with amplifier 36, and it is changed with A/D converter 38, is processed by the data-processing section 46 and the Log transducer 48, is used as press can data, and is memorized by the press can memory 50. Moreover, in this case, the information recorded on the films F, such as Film ID and the DX code, is read on a carrier 30, and required image information etc. is sent to the parameter integrated section 76 or retrieval means 80 grade.

[0066] If press can data are memorized by the press can memory 50, the press can processing section 54 will read, each coma will be started, and the press can image will be indicated by sequential at a display 20. In this case, the image processing is unnecessary. An operator chooses the coma (coma to print) which looked at the display of a display, for example, was re-ordered using GUI. According to this selection, the setup section 70 performs required operations, such as creation of a gray level histogram, and image characteristic quantity, for every coma from press can data like the 1st processing mode, and while setting up the reading conditions of this scan and sending to a scanner 12, the information set up as image information (retrieval information) is sent to the retrieval means 80 from the parameter integrated section 76.

[0067] If required image information (retrieval information) gathers, the retrieval means 80 searches the storage means 78, it will choose the coma (coma which serves as a candidate) presumed to be the same as the re-ordered coma from the coma memorized by the storage means 78, will read the image information, and will send image-processing information to the setup section 70 from the parameter integrated section 76.

[0068] From the image-processing information sent from the computed image characteristic

quantity and the parameter integrated section 76, about each selected coma, the setup section 70 sets up processing and sends it to the parameter integrated section 76 so that the processing on the occasion of processing by the 1st processing mode may be reproduced, namely, so that it may be the same conditions and the same image processing (the processing in the signal transformation section 68 is also included) may be performed in the same sequence.

[0069] In this example, the parameter integrated section 76 sets the supplied image-processing conditions as the predetermined location of the press can processing section 54 and this scanning-and-processing section 56. Thereby, press can data are read from the press can memory 50, and the press can processing section 54 processes each selected coma on the set-up image-processing conditions, and displays it on a display 20 one by one as a simulation image. An operator looks at a display 20, checks whether the propriety of an image, i.e., retrieval of image information, has been performed proper, and if proper, he will issue output directions.

[0070] In addition, directions to that effect are issued and an un-fitness retrieval image is processed by said 1st processing mode about the coma. Moreover, in advance of processing (display of a simulation image) of a press can image, the coma (the image and information on the coma) which the retrieval means 80 searched and chose may be displayed on a display, and the right or wrong of a retrieval result may be checked. In this case, two or more coma is displayed in order of a candidate, and an operator may be made to choose the re-ordered coma.

[0071] This scan will be started, if processing of image data was decided and preparation is completed with output directions. In addition, it is the same as that of the 1st processing mode which may perform this scan before output directions according to reading condition decision etc. as long as this scan is possible. This scan is fundamentally performed like the 1st processing mode, a scanner 12 reads by the radical of the reading conditions of this supplied scan, it is amplified with amplifier 36, considers as a digital signal with A/D converter 38, it is processed in the data-processing section 46 of a processor 14, considers as these scanning data by the Log transducer 48, and it is memorized [the output signal from image sensors 34 is sent to this scanning memory 52, and]. Subsequently, these scanning data are read from this scanning memory 52, and are processed on the processing conditions set up in the processing section 66, and it considers as the image data for an output be changed up in the signal transformation section 68, and is outputted to a printer 16, and the print reproducing this is outputted.

[0072] In processing by the 2nd processing mode, a transfer and storage of the image information to the storage means 78 are not performed, but it leaves the image information at the time of processing by the 1st processing mode previously.

[0073] Although the simulation image was displayed on the display 20 and the image was checked in the 2nd processing mode in the above example (check of a retrieval result) When the coma for which limitation was not carried out to this but the operator was re-ordered from it is directed, the setup section 70 reproduces previous processing and the parameter integrated section 76 sets image-processing conditions etc. as this scanning-and-processing section 56, this invention may decide processing and may perform this scan.

[0074] Furthermore, processing by the 3rd processing mode is explained with reference to drawing 4 (C). The 3rd processing mode is the mode corresponding to a rehash of the so-called print which the print outputted previously is unsuitable nature and mainly creates a print again among the reprints which process again the coma already processed by the 1st processing mode in the photograph printer 10.

[0075] It sets to processing by the 3rd processing mode, and processing is performed like [the display of the directions of a coma – the simulation image which a press can – press can image displays and rehashes] said 2nd processing mode. In addition, when it is thought that retrieval by the retrieval means 80 is unsuitable nature, the coma may process by the 1st processing mode, and may perform a check and selection of a retrieval result like said 2nd processing mode.

[0076] If a simulation image is displayed, like the 1st processing mode, an operator will look at the display of a display 20, will authorize the coma to rehash, and will perform adjustment of a color, concentration, gradation, etc. using the adjustment key set as keyboard 18a if needed (manual amendment). The signal of adjustment is sent to the key amendment section 74, the

amount of amendments of image-processing conditions is computed, the image-processing conditions which this amount of amendments set as parameter integrated section 76 **, the processing section 62, and the processing section 66 are amended, and the image displayed on a display 20 also changes according to the input by the operator. If an operator judges with Assay O.K., using keyboard 18a etc., he will perform output directions and the processing performed to the coma (image) will decide him.

[0077] According to output directions, if preparation has been completed, this scan will be started, a scanner 12 performs this scan on the radical of the reading conditions of this supplied scan, and it is amplified with amplifier 36, it considers as a digital signal with A/D converter 38. It is processed in the data-processing section 48 of a processor 14, and it is considered as these scanning data by the Log transducer 50, and the output signal from image sensors 34 is sent to this scanning memory 52, and is memorized. In addition, it is the same as that of the 1st processing mode which may perform this scan before output directions according to reading condition decision etc. as long as this scan is possible. Subsequently, these scanning data are read from this scanning memory 52, and are processed on the processing conditions set up in the processing section 66, and it considers as the image data for an output be changed up in the signal transformation section 68, and is outputted to a printer 16, and the print reproducing this is outputted.

[0078] Furthermore, in the 3rd processing mode, the parameter integrated section 76 updates delivery and the rehashed image information of a coma for the image information (retrieval information and image-processing information) of each coma for the storage means 78 according to output directions. For example, the image information previously memorized when the coma was processed by the 1st processing mode is overwritten, and image information including the image-processing information decided by processing by the 3rd processing mode is memorized. Or while memorizing to a position image information including the image-processing information decided by processing by the 3rd processing mode, the image information memorized when the coma was processed by the 1st processing mode may be deleted.

[0079] According to this invention, so that more clearly than the above explanation in a coincidence print In case it is the re-order print with which the image information for reproducing processing is memorized by the 1st processing mode, and the output of the same image as a coincidence print is demanded Since a previous image processing is reproducible with the 2nd processing mode using the image-processing information at the time of a coincidence print The suitable re-order print the coincidence print and whose image corresponded can be outputted, and image information at the time of an important coincidence print is not unnecessarily eliminated in this case. On the other hand, by unsuitable nature, when the print outputted on a coincidence print rehashes, it can rewrite the image information at the time of a coincidence print if needed, and can be suitably equivalent to subsequent re-order prints with the 3rd processing mode. That is, according to this invention, the case where he wants to update the image information accumulated in a database, and the case where he does not want to update are cut suitably, are divided, and can be chosen.

[0080] Moreover, in the case of the dust with which the reason of a rehash adhered to a film or printing paper, it is not necessary to change the time of a coincidence print, and image-processing conditions fundamentally but, and since according to this invention image information is used in the case of a rehash and the processing at the time of a coincidence print is reproduced by the 3rd processing mode at it, it is not necessary to perform an unnecessary operation and an efficient activity can be done. Furthermore, since the color ' concentration adjustment in the case of a rehash are also performed after reproducing processing of a coincidence print, rates, such as an operation, can be improved.

[0081] Here, in this invention, it is with the 2nd processing mode and the 3rd processing mode and the retrieval range and retrieval parameter in the storage means 78 may be changed. In many cases, in the case of the 2nd processing mode, i.e., a re-order, a certain amount of time amount has passed since the processing (coincidence print) by the 1st processing mode. Moreover, also when receiving the re-order of the coma (film) which is not processed by the 1st processing mode, it is plentifully, and in this case, image information is not memorized in that lab

(processing laboratory). On the other hand, although the client of print creation may have the dissatisfaction in an image and may request a rehash from the case of the 3rd processing mode, i.e., a rehash, this is a fraction comparatively and many are the cases where un-arranging is found when a print is checked before shipment in a lab, and it rehashes. That is, image information is memorized almost certainly in the lab performing processing by the 3rd processing mode immediately after processing by the 1st processing mode in many cases.

[0082] Therefore, in both, the retrieval precision demanded differs from retrieval range, such as a processing date, by changing the retrieval range, a retrieval parameter, etc. by the 2nd processing mode and the 3rd processing mode, it is more efficient and more proper processing which prevented the false retrievals of image information can be performed.

[0083] As mentioned above, although the explained mode mainly has three sorts of modes of the 2nd processing mode corresponding to a re-order print which mainly carries out coincidence print correspondence, and the 3rd processing mode mainly corresponding to a rehash of a print the 1st processing mode, limitation may not be carried out to this, and the image processing system of this invention may not have the 3rd processing mode, but may have only the 1st processing mode and the 2nd processing mode.

[0084] Or the processing in the 2nd processing mode is changed according to the activity by the operator, and you may enable it to correspond to a rehash in the mode which has only these 2 modes.

[0085] In this mode, the display and assay (check of a retrieval result) of a simulation image of the point that process like the above-mentioned mode and a reprint is outputted after assay according to output directions are the same in the 2nd processing mode. Here, when an operator looks at a simulation image and does not adjust an image at all, image information is not memorized for the storage means 78, but it leaves the image information at the time of processing by the 1st processing mode. When a simulation image is seen and an operator adjusts an image on the other hand (i.e., when there are correction directions of processing) Overwrite record of the image information including the image-processing information decided after adjustment is carried out at the image information memorized when the coma was processed by the 1st processing mode. Or the image information memorized when the coma was processed by the 1st processing mode, while memorizing new image information to the position is deleted, and image information is updated.

[0086] Moreover, in this invention, you may have a means to perform the read-out directions according to not selection but the coincidence print and reprint (a re-order and rehash) of the mode of the 1st processing mode, the 2nd processing mode, etc., and storage directions. In addition, what is necessary is for keyboard 18a and GUI just to constitute these directions means like said mode selection.

[0087] In this mode, when there are no read-out directions by the read-out directions means on the occasion of print creation, that coma (film) performs the same processing as the 1st above-mentioned processing mode noting that it is a coma which has not been processed in a coincidence print or the past.

[0088] Moreover, when read-out directions are carried out by the read-out directions means, retrieval of the storage means 78 is performed by the retrieval means 80 like the above-mentioned mode. Here, when the image information (image-processing information) corresponding to the coma which creates a print is not read by the retrieval means 78, subsequent processings are performed like said 1st processing mode. On the other hand, although the same processing as the 2nd above-mentioned processing mode is performed when the image information corresponding to the coma which creates a print is read by the retrieval means 78, a storage directions means becomes effective in this case. In this case, when it sets and there are no storage directions by the storage directions means, renewal of image information is not performed. On the contrary, when adjustment of an image etc. is performed and there are storage directions by the storage directions means according to it, while overwriting renewal of corresponding image information, i.e., new image information, at the image information of the coma memorized previously or memorizing new image information to a position, the image information of the coma memorized previously is deleted.

[0089] It sets to the image processing system of such this invention, and the image data for an output is outputted to various kinds of storages, such as not only the printer 16 but a floppy disk, an MO disk (magnetic-recording disk), CD-R, etc., and is good also as an image file.

[0090] Moreover, the image processing system of this invention is available suitable not only for a digital photograph printer like the example of illustration but the usual photograph printer of direct exposure. As everyone knows, the image photoed by the film also in the photograph printer of direct exposure is read in photoelectricity with a low resolution, and the amount of insertion of the color filter in the case of baking, image-processing conditions, i.e., printing paper, from the obtained image data, the amount of a diaphragm, etc. are computed, and the light of the projection light of a film is modulated according to this (namely, image processing). When using this invention for the photograph printer of direct exposure, if the amount of insertion of this color filter etc. is memorized, coincidence of a coincidence print and a reprint and processing in the case of a rehash can be suitably performed like a digital photograph printer as for example, image-processing information.

[0091] As mentioned above, although the image processing system of this invention was explained to the detail, this invention of various kinds of amelioration and modification being made is natural in the range which limitation is not carried out to the above-mentioned example, and does not deviate from the summary of this invention.

[0092]

[Effect of the Invention] As mentioned above, the image which was reproduced by the coincidence print according to this invention as explained to the detail, The reprint by which the image a color and whose concentration correspond suitably was reproduced is stabilized. And when you want to update the information memorized in the database in order to be able to create at good effectiveness, and to be also able to perform the rehash accompanied by amendment of an image upwards at good effectiveness and to reproduce a coincidence print. The case where he does not want to update is cut suitably, is divided, and is chosen, and it can prevent deleting required information unnecessarily.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram of an example using the image processing system of this invention of a digital photograph printer.

[Drawing 2] (A) shows the conceptual diagram of the image sensors arranged at the digital photograph printer by which (B) is shown in drawing 1 in the conceptual diagram of the scanner with which the digital photograph printer shown in drawing 1 is loaded, respectively.

[Drawing 3] It is the block diagram of an example of the image processing system of the digital photograph printer shown in drawing 1.

[Drawing 4] (A), (B), and (C) are the flow charts for explaining the processing in the digital photograph printer shown in drawing 1.

[Description of Notations]

10 Digital Photograph Printer

12 Scanner

14 Image Processing System

16 Printer

18 Actuation System

20 Display

22 Light Source

24 Variable Aperture

28 Diffusion Box

30 Carrier

32 Image Formation Lens Unit

34 Image Sensors

36 Amplifier

38 A/D Converter

42 Magnetic Head

44 Code Reader

46 Data-Processing Section

48 Log Converter

50 Press Can (Frame) Memory

52 This Scanning (Frame) Memory

54 Press Can Processing Section

56 This Scanning-and-Processing Section

58 Conditioning Section

62 66 (image) Processing section

64 68 Signal transformation section

70 Setup Section

74 Key Amendment Section

76 Parameter Integrated Section

78 Storage Means

80 Retrieval Means

[Translation done.]

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[Procedure amendment 1]

[Document to be Amended] Specification

[Item(s) to be Amended] 0043

[Method of Amendment] Modification

[The contents of amendment]

[0043]

If it is the film F of an advanced photo system, since the above-mentioned film ID is set up as film information, for example, Film F can be specified using this. In addition, as mentioned above, since Film ID is recorded as magnetic information and indicated by the cartridge and the index print, it is acquirable with reading of the magnetic information by the carrier 30, the keyboard entry by the operator, etc.

[Procedure amendment 2]

[Document to be Amended] Specification

[Item(s) to be Amended] 0054

[Method of Amendment] Modification

[The contents of amendment]

[0054]

An operator directs print creation initiation, after performing wearing on the scanner 12 of the carrier according to Film F, the set of the film F to a carrier 30, selection of the 1st processing mode, the print size to create, various kinds of required directions, an informational input, etc. The image which slit scanning of the film F was carried out [in / the drawing value of the variable aperture 24 of a scanner 12 etc. is set up corresponding to the reading conditions of a press can by this, and after that and a carrier 30 convey Film F in the direction of vertical scanning at the rate of a press can and / the reading station predetermined as mentioned above], and projection light carried out image formation to image sensors 34, and was photoed by Film F is disassembled into R, G, and B, and it is read in photoelectricity.

Moreover, in the case of conveyance of the film by the carrier 30, the DX code and the magnetic information which were recorded on Film F are read, and it is sent to a processor 14.

By the above actuation, the parameter integrated section 76 section acquires retrieval information, such as Film ID, a film kind, and a coma number, from the information on the carrier with which it was equipped, magnetic information, or the reading result of the DX code.

[Procedure amendment 3]

[Document to be Amended] Specification

[Item(s) to be Amended] 0062

[Method of Amendment] Modification

[The contents of amendment]

[0062]

This scan is performed like a press can except reading conditions turning into reading conditions of this scan set up for every coma, and the output signal of image sensors 34 is processed with amplifier 36 and A/D converter 38, is processed in the data-processing section 48 of a processor 14, is used as these scanning data by the Log transducer 50, and is sent to this scanning memory 52.

If these scanning data are sent to this scanning memory 52, it will be read by this scanning-and-processing section 58, and the image field of each coma will be started, an image processing is carried out on the image-processing conditions decided for every coma in the processing section 66, subsequently, it is changed in the signal transformation section 68, considers as the image data for an output, and is outputted to a printer 16, and the print which reproduced this image data is created.

[Procedure amendment 4]

[Document to be Amended] Specification

[Item(s) to be Amended] 0071

[Method of Amendment] Modification

[The contents of amendment]

[0071]

This scan will be started, if processing of image data was decided and preparation is completed with output directions. In addition, it is the same as that of the 1st processing mode which may perform this scan before output directions according to reading condition decision etc. as long as this scan is possible.

This scan is fundamentally performed like the 1st processing mode, a scanner 12 reads by the radical of the reading conditions of this supplied scan, it is amplified with amplifier 36, considers as a digital signal with A/D converter 38, it is processed in the data-processing section 46 of a processor 14, considers as these scanning data by the Log transducer 48, and it is memorized [the output signal from image sensors 34 is sent to this scanning memory 52, and].

Subsequently, these scanning data are read from this scanning memory 52, and are processed on the processing conditions set up in the processing section 66, and it considers as the image data for an output changed in the signal transformation section 68, and is outputted to a printer 16, and the print reproducing this is outputted.

[Procedure amendment 5]

[Document to be Amended] Specification

[Item(s) to be Amended] 0076

[Method of Amendment] Modification

[The contents of amendment]

[0076]

If a simulation image is displayed, like the 1st processing mode, an operator will look at the display of a display 20, will authorize the coma to rehash, and will perform adjustment of a color, concentration, gradation, etc. using the adjustment key set as keyboard 18a if needed (manual amendment).

The signal of adjustment is sent to the key amendment section 74, the amount of amendments of image-processing conditions is computed, this amount of amendments is sent to the parameter integrated section 76, the image-processing conditions set as the processing section 62 and the processing section 66 are amended, and the image displayed on a display 20 also changes according to the input by the operator.

If an operator judges with Assay O.K., using keyboard 18a etc., he will perform output directions and the processing performed to the coma (image) will decide him.

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(71)出願人 000005201

富士写真フィルム株式会社

神奈川県南足柄市中沼210番地

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(72)発明者 山口 博司

神奈川県足柄上郡開成町宮台798番地 富士写真フィルム株式会社内

(74)代理人 100080159

弁理士 渡辺 望穂

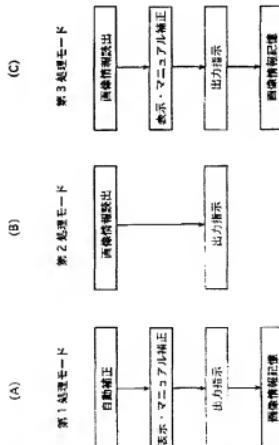
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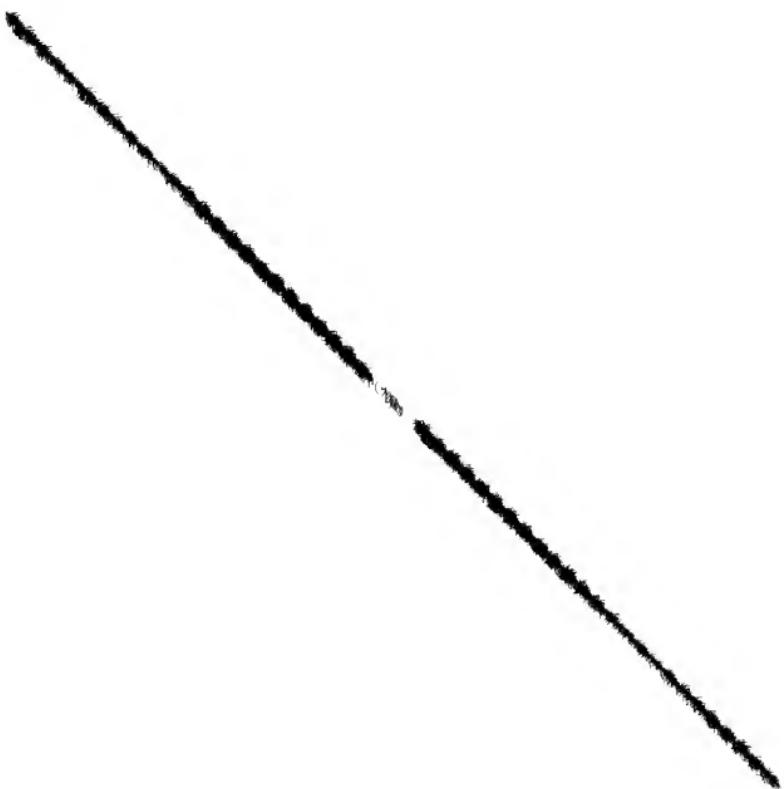
(54)【発明の名称】 画像処理装置

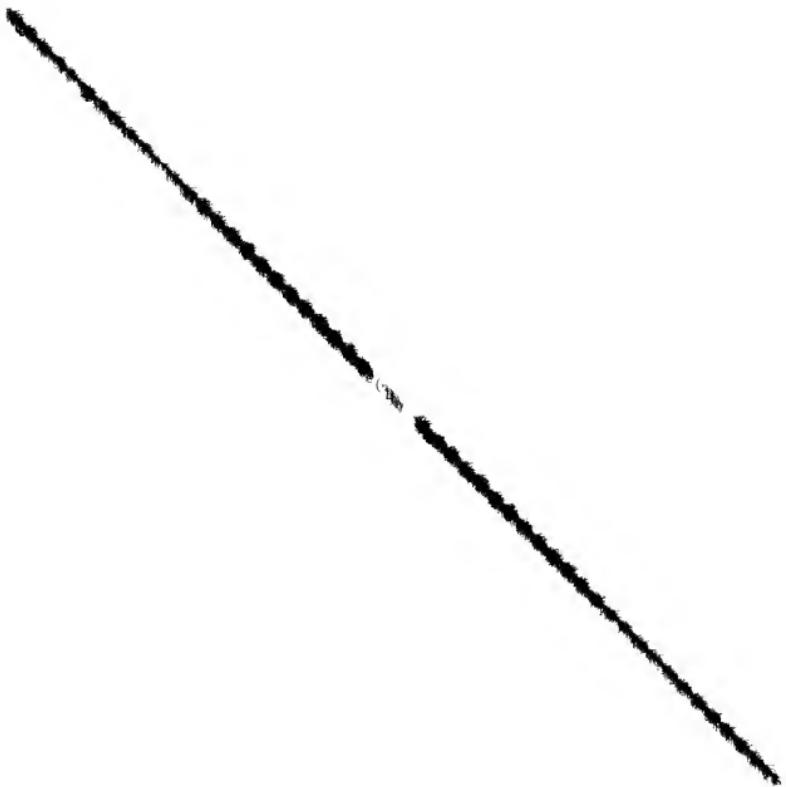
(57)【要約】

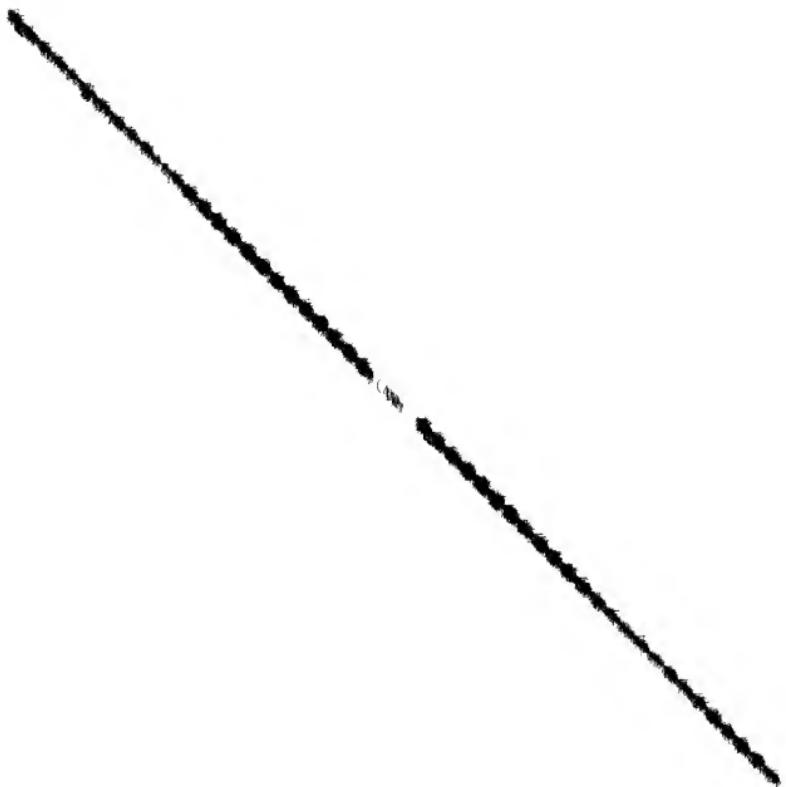
【課題】フリントシステムにおいて、再注文プリントでは、前回のプリントと一致した画像を安定して再現することができ、また、焼き直しも、良好な作業性でおこなうことができる画像処理装置を提供する。

【解決手段】処理画像に関連する画像情報を記憶する記憶手段と、第1および第2、あるいはさらに第3処理モードを備える選択手段とを有し、第1処理モードにおいては、画像データを用いて処理を設定すると共に、画像情報を記憶手段に記憶し、第2処理モードにおいては、記憶手段から画像情報を読み出し、画像情報から画像の処理を設定し、第3処理モードにおいては、記憶手段から画像情報を読み出し、この画像情報を利用して画像の処理を設定すると共に、画像情報を更新することにより、前回課題を解決する。









キャナ 12によって読み取られたフィルム F の画像以外にも、反射原稿の画像を読み取る画像読取装置、デジタルカメラやデジタルビデオカメラ等の撮像デバイス、LAN (Local Area Network) やコンピュータ通信ネットワーク等の通信手段、メモリカードや MO (光磁気記録媒体) やフロッピーディスク等のメディア (記録媒体) 等の、各種の画像読取手段や撮像手段、画像データの記憶手段等の、各種の画像データ供給源から画像データを受け取り、以下に示すような処理を施してもよい。

【0027】図 3 に、画像処理装置 14 のブロック図を示す。図 3 に示されるように、画像処理装置 14 (以下、処理装置 14 とする) は、データ処理部 46、Lo g 変換器 18、フレンスキャン (フレーム) メモリ 50、本スキャン (フレーム、メモリ 52、フレンスキャン処理部 54、本スキャン処理部 56、および条件設定部 58 を有して構成される。また、条件設定部 58 (後述するパラメータ統合部 76) には、記憶手段 78 および検索手段 80 が接続される。なお、図 3 は、主に画像処理関連の部位を示すものであり、画像処理装置 14 には、これ以外にも、処理装置 14 を含むフォトプリント 10 全体の制御や管理を行う P.U.、フォトプリント 10 の作動等に必要な情報を記憶するメモリ、可変絞り 24 の絞り値や C.C.D センサ 34 の露積時間等を決定する手段等が配置され、また、操作部 18 やディスプレイ 20 は、この C.P.U. (C.P.U. パーク) を介して各部位に接続される。

【0028】このような処理装置 14 は、一例として、常に静止プリントに対する第 1 処理モード、再プリントに対するモードであって、主に再注文プリントに対応する第 2 処理モードおよび主にプリントの焼き直しに対応する第 3 処理モードの、3 つの処理モードを有し、選択されたモードに応じて、画像データの処理 (画像の処理) を行う。なお、処理モードの選択方法には特に限定ではなく、キーボード 8 a による入力、ディスプレイ 20 とマウス 18 によって示される GUI (graphical user interface) 等の公知の手法を用いればよい。

【0029】スキャナ 12 から出力された R、G および B の各原稿信号は、まず、データ処理部 46 において、D.C. オフセット補正、階調補正、シェーディング補正等の補正処理を施され、Lo g 変換器 18 で変換されてデジタルの画像データとされて、フレンスキャン (画像) データはフレンスキャンメモリ 50 に、本スキャン (画像) データは本スキャンメモリ 52 に、それぞれ記憶 (格納) される。

【0030】フレンスキャンメモリ 50 に記憶されたフレンスキャンデータはフレンスキャン処理部 54 で処理されて、ディスプレイ 20 による表示に対応する画像データとされ、本スキャンメモリ 52 に記憶された本スキャンデータは、本スキャン処理部 56 で処理されて、プリンタ 16 による出力に応じる画像データとされる。フレン

スキャン処理部 54 は、画像処理部 62 および信号変換部 64 を有して構成される。他方、本スキャン処理部 56 は、画像処理部 66 および信号変換部 68 を有して構成される。

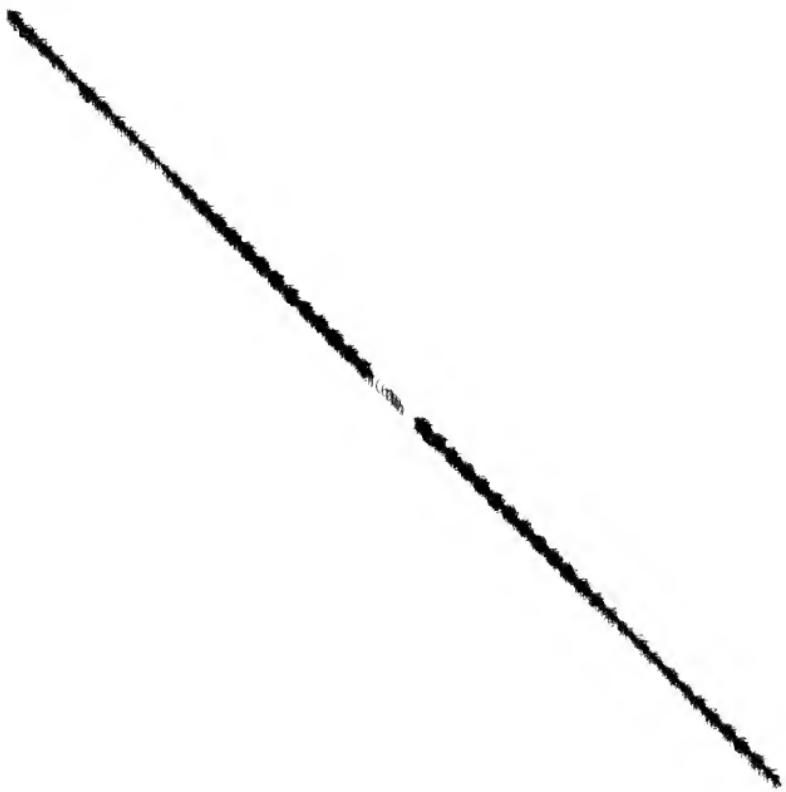
【0031】フレンスキャン処理部 54 の画像処理部 62 (以下、処理部 62 とする) と、本スキャン処理部 56 の画像処理部 66 (以下、処理部 66 とする) は、共に、後に詳述する条件設定部 58 の設定に応じて、スキャナ 12 によって読み取られた画像 (画像データ) に画像処理を施す部位である。両者は、処理する画像データの画像密度が異なる以外には、基本的に同様の処理を行う。

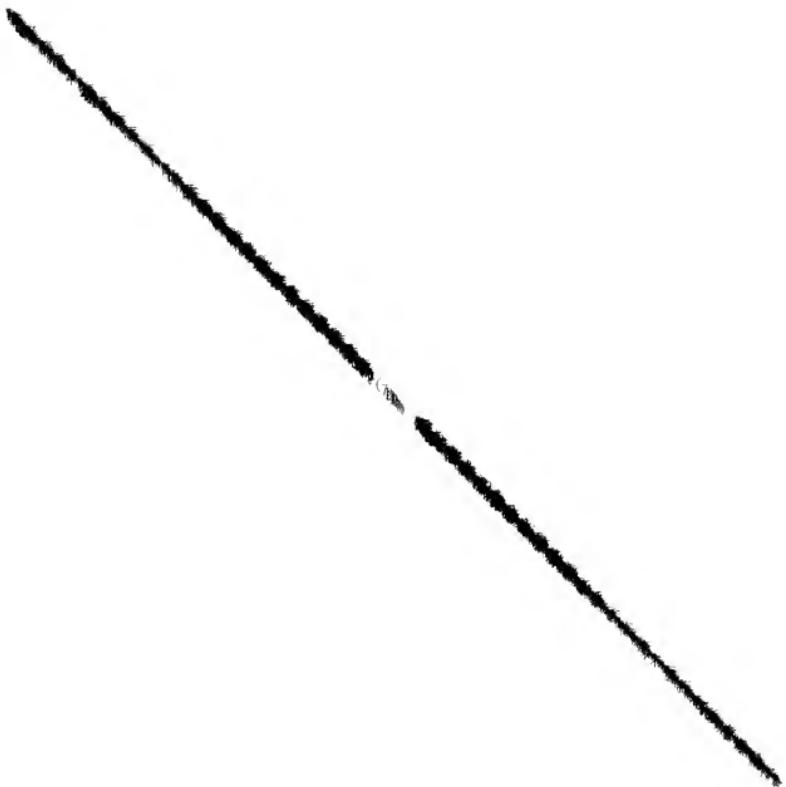
【0032】処理部 62 および処理部 66 における画像処理は、公知の各種の画像処理であって、一例として、グレーバランス調整、階調調整、濃度調整、電子変倍処理、シャープネス (鮮銳化) 処理、粒状抑制処理、複数焼き処理 (中間階調を維持した画像データ圧縮による、直接露光のフォトプリントにおける複数焼き効果の付与)、幾何学歪補正、周辺光量補正、赤目補正、ソフトフォーカスや白黒仕上げなどの特殊な処理等の 1 以上が例示される。

【0033】これらの各処理は、公知の方法で行えばよく、処理演算 (アルゴリズム)、加算器や減算器による処理、L.U.T (ルックアップテーブル) による処理、マトリクス (MTX) 演算、フィルタによる処理等を適宜組み合わせて行われる。一例を挙げれば、グレーバランス調整、濃度調整および階調調整は、画像特徴量に応じて作成される L.U.T を用いる方法が、彩度調整は、MTX 演算を用いて行う方法が、シャープネス処理は、画像を周波数成分に分け、中・高周波数成分から得られた輝度信号にシャープネスゲイン (鮮銳度補正係数) を乗算して、得られた輝度情報を低周波数成分に加算する方法が、それぞれ例示される。

【0034】フレンスキャン処理部 54 の信号変換部 64 は、処理部 62 によって処理された画像データを、3.D (3 次元) - L.U.T 等で変換して、ディスプレイ 20 による表示に対応する画像データにする部位である。他方、本スキャン処理部 56 の信号変換部 68 は、処理部 66 によって処理された画像データを 3.D - L.U.T 等で変換して、プリンタ 16 による画像記録に対応する画像データに変換し、プリンタ 16 に供する部位である。両変換部における処理条件は、共に、条件設定部 58 で設定される。

【0035】フレンスキャン処理部 54 および本スキャン処理部 56 で施す画像処理および既定条件は、条件設定部 58 によって設定される。この条件設定部 58 は、セットアップ部 70、キー操作部 74 およびパラメータ統合部 76 を有して構成され、また、パラメータ統合部 76 には、前述のように、検索部 78 (および記憶手段 78) が接続されている。





キャンメモリ50に記憶される。

【0057】プレスキンメモリ50にプレスキャンデータが記憶されると、セットアップ部70がこれを読み出し、1コマ毎の画像領域を切り出し、さらに、前述のように、各コマ毎に、順次、濃度ヒストグラムの作成や画像特徴量の算出を行し、その結果から、可変較り24の絞り値等のそれぞれのコマの本スキャンの読み取条件を設定し、スキヤナ12に送る。セットアップ部70は、さらに、所定コマ数の画像データがそろった時点で、濃度ヒストグラムおよび画像特徴量、オペレータによる指示等に応じて、各コマ毎に、実行する画像処理を選択し、その順番を決定し、各画像処理の画像処理条件(信号変換条件)を算出し、自動補正)、さらに、必要に応じて、压缩画像や開拓引き画像の生成等を行う。設定された画像処理条件および特性は、パラメータ統合部76に送られる。また、パラメータ統合部76は、設定された画像処理条件等を、プレスキャン処理部54および本スキャン処理部56の所定位置に設定する。

【0058】画像処理条件がプレスキャン処理部54に設定されるると、プレスキンメモリ50からプレスキャンデータが読み出され、処理部62において各コマの画像領域が切り出されて設定された画像処理条件に応じて画像処理され、次いで、信号変換部64に供給されてディスプレイ20での表示に応じた画像データに変換され、各コマのプレスキン画像が、ショミレーション画像としてディスプレイ20に表示される。なお、表示は、1コマずつでも複数コマずつでもよい。

【0059】オペレータは、ディスプレイ20の表示を見て、1コマずつ順次、画像の確認(検定)を行い、必要に応じて、キーボード18に設定された調整キー等を用いて、色、濃度、階調等の調整(マニュアル補正)を行う。調整の結果は、キー補正部74に送られる。キー補正部74は、方に応じた画像処理条件の補正量を算出し、これをパラメータ統合部76におく。パラメータ統合部76は、送られた補正量に応じて、処理部62および処理部66に設定した画像処理条件を補正する。従って、オペレータによる入力に応じて、ディスプレイ20に表示される画像も変化する。

【0060】オペレータは、ディスプレイ20に表示される画像が遡行にあると判定(検定OK)すると、キーボード18等を介して、出力指示を行う。これにより、そのコマ(画像)に施す処理が確定する。

【0061】プレスキンの終了および検定の進行に応じて、本スキャンが可能な状態になると、本スキャンが開始され、スキヤナ12において可変較り24の絞り値等が設定されたコマの本スキャンの読み取条件に調整される。また、キー補正部74が本スキャンの速度でフィルム1を搬送する。なお、検定を行わない場合には、パラメータ統合部76による本スキャン処理部56への画像処理条件の設定を終了した時点で検定終了とし、本ス

キャンが開始される。検定の有無は、モードとして選択可能にするのが好ましい。また、フレスキンが終了した後、読み取条件の確定等に応じて、本スキャンが開始可能な状態になれば、出力指示を待たずに本スキャンを開始して、本スキンデータとして、本スキンメモリ52に記憶しておいてもよい。

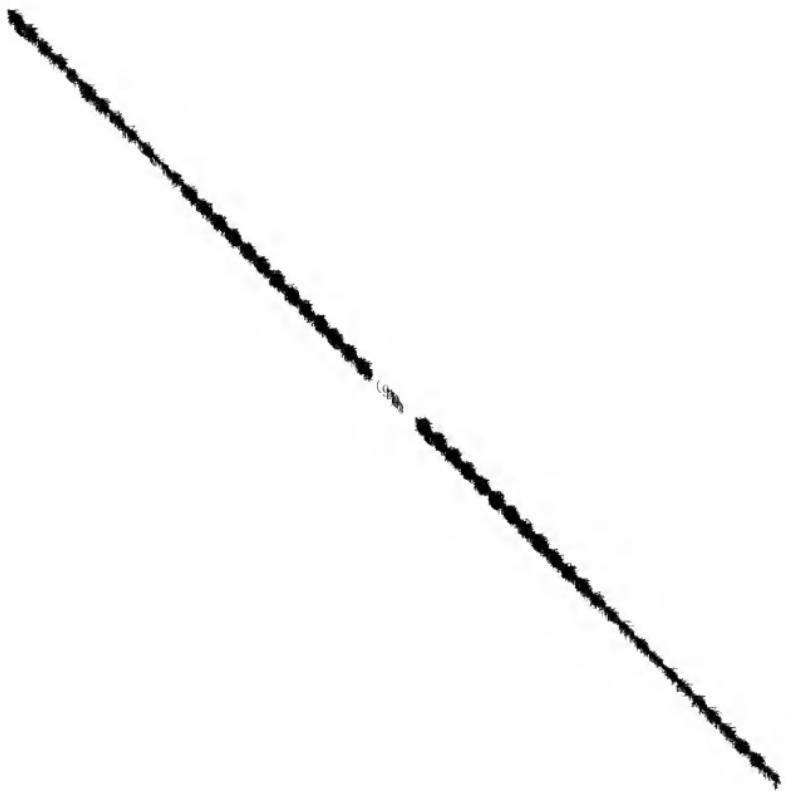
【0062】本スキャンは、読み取条件が各コマ毎に設定された本スキンの読み取条件となる以外はプレスキンと同様に行われ、イメージセンサ31の出力信号はアンプ36、A/D変換器38で処理され、処理装置14のデータ処理部48で処理されて、Log変換器50で本スキンデータとされ、本スキンメモリ52に送られる。本スキンデータが本スキンメモリ52に送られると、本スキン処理部58によって読み出され、各コマの画像領域が切り出され、処理部66において各コマ毎に確定した画像処理条件で画像処理され、次いで、信号変換部68で変換されて出力用の画像データとされ、プリンタ16に出力され、この画像データを再生したプリントが作成される。

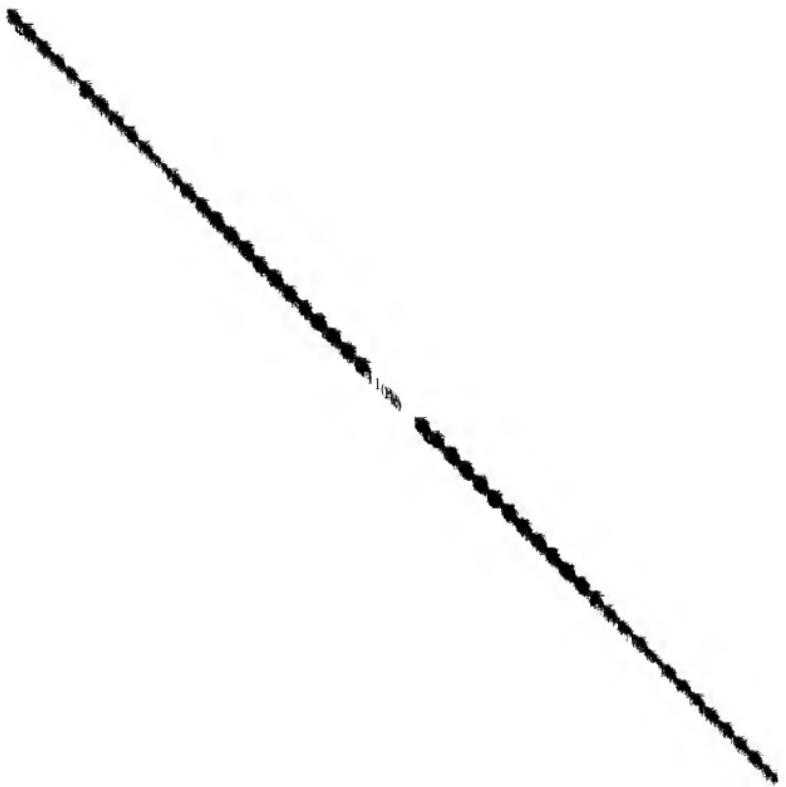
【0063】さらに、パラメータ統合部76は、出力指示に応じて、各コマの所定の画像情報(検索情報および画像処理情報)を対応付けて記憶手段78に送り、記憶させる。

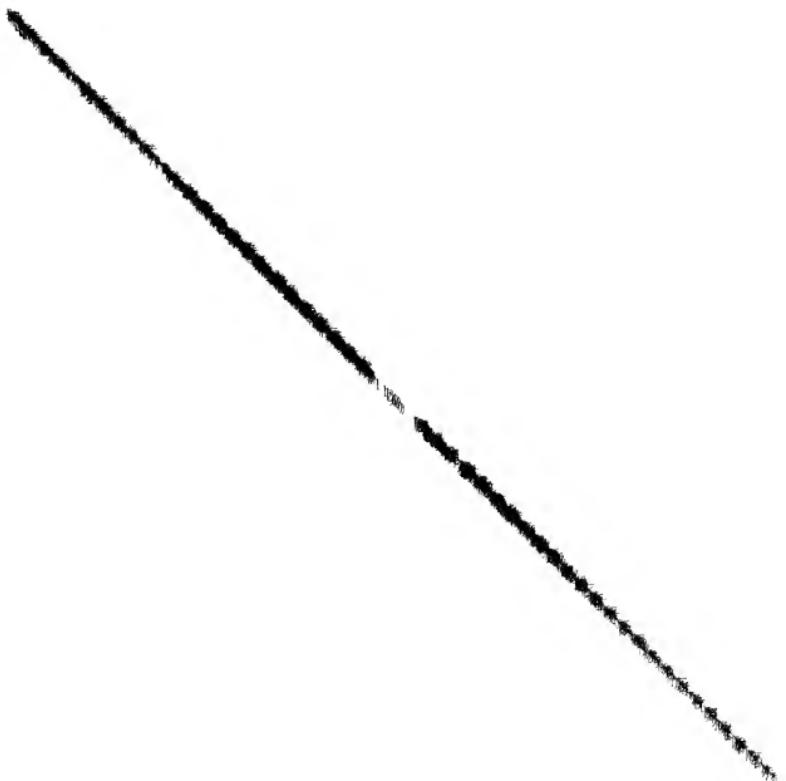
【0064】次いで、図4(B)を参照して、第2処理モードについて説明する。第2処理モードは、既にファトプリンタ10において第1処理モードで処理したコマを再度処理する再プリントのうち、特に、先と全く同じ画像を出力する、いわゆるプリントの再びに対応するモードである。先の第1処理モードと同様、オペレータは、フィルムFに応じたキャリアのスキヤナ12への装着、キャリア30へのフィルムFのセット、第2処理モードの選択、作成するプリントサイズ、各種の必要な指示や情報を入力等を行った後に、プリント作成開始を指示する。

【0065】この開始の指示により、キャリア30がフィルムFの搬送を開始し、1コマ毎から順次プレスキンが行われる。プレスキンは、第1処理モードと同様に行われ、プレスキンの読み取条件のもと、フィルムFの投影光がイメージセンサ31に照射して、出力信号がアンプ36で增幅され、A/D変換器38で変換され、データ処理部46およびLog変換器48で処理されて、プレスキンデータとされ、フレスキンメモリ50に記憶される。また、この際に、フィルム1D、DXコード等のフィルムFに記録される情報がキャリア30で読み取られ、必要な画像情報等がパラメータ統合部76や検索手段80等に送られる。

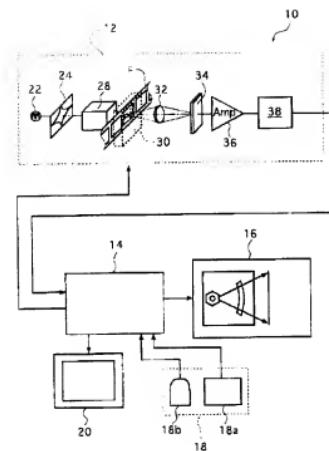
【0066】プレスキンメモリ50に、フレスキンデータが記憶されると、フレスキン走査部44が読み出し、各コマを切り出して、フレスキン画像をディスプレイ20に順次表示する。この際に、直線処理は不



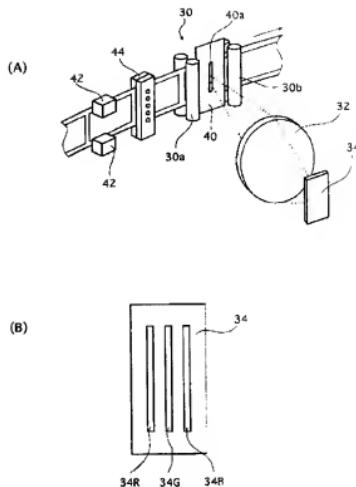




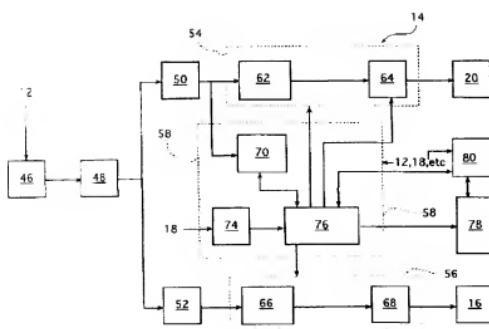
【図1】



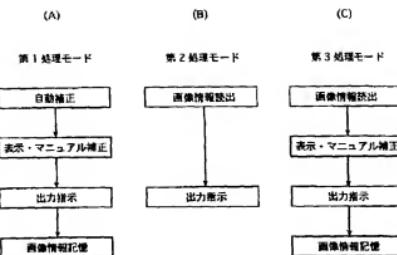
【図2】



【図3】



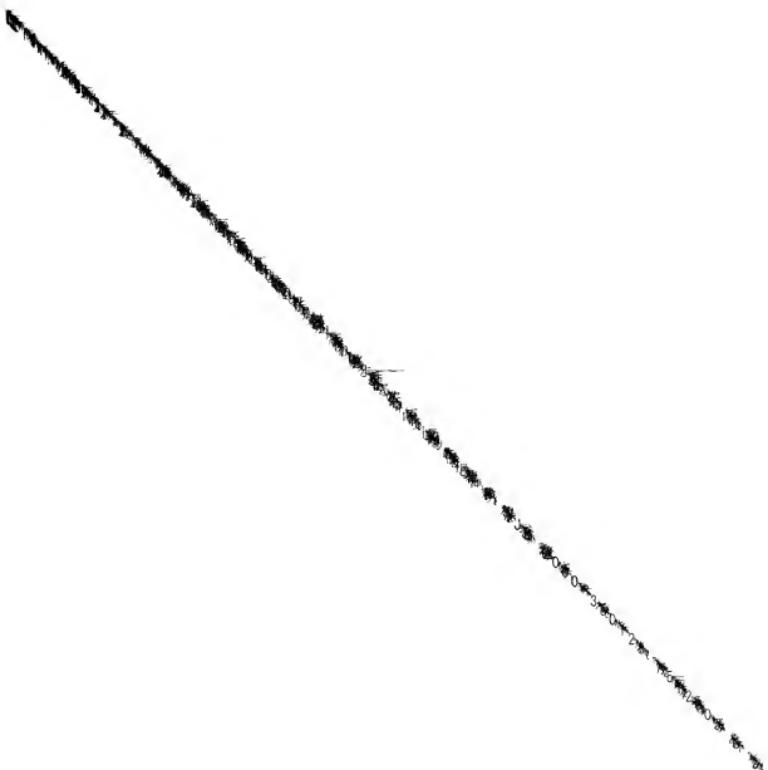
【図4】



フロントページの記述

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や磁気情報が読み取られ、処理装置 14 に送られる。

以上の操作によって、装着されたキャリアの情報、磁気情報や DX コードの読み取り結果から、パラメータ統合部 76 部が、フィルム ID、フィルム種、コマ番号等の検索情報を取得する。

【手続補正 3】

【補正対象書類名】明細書

【補正対象項目名】0062

【補正方法】変更

【補正の内容】

【0062】

本スキャンは、読み取条件が各コマ毎に設定された本スキャンの読み取条件となる以外はフレスキヤンと同様に行われ、イメージセンサ 34 の出力信号はアンプ 36、A/D 変換器 38 で処理され、処理装置 14 のデータ処理部 48 で処理されて、Log 変換器 50 で本スキャンデータとされ、本スキャンメモリ 52 に送られる。

本スキャンデータが本スキャンメモリ 52 に送られると、本スキャン処理部 58 によって読み出され、各コマの画像領域が切り出され、処理部 66 において各コマ毎に確定した画像処理条件で画像処理され、次いで、信号変換部 68 で変換されて出力用の画像データとされ、プリンタ 16 に出力され、この画像データを再生したプリントが作成される。

【手続補正 4】

【補正対象書類名】明細書

【補正対象項目名】0071

【補正方法】変更

【補正の内容】

【0071】

出力指示によって、画像データの処理が確定し、準備が完了していれば本スキャンが開始される。なお、読み取条件確定等に応じて本スキャンが可能であれば、出力指示の前に本スキャンを行ってもよいのは第 1 処理モードと同様である。

本スキャンは、基本的に第 1 処理モードと同様に行われ、スキャナ 12 は、供給された本スキャンの読み取条件の基で読み取りを行い、イメージセンサ 34 からの出力信号はアンプ 36 で増幅されて、A/D 変換器 38 でデジタル信号とされ、処理装置 14 のデータ処理部 46 で処理されて、Log 変換器 48 で本スキャンデータとされ、本スキャンメモリ 52 に送られ、記憶される。

次いで、本スキャンデータが本スキャンメモリ 52 から読み出され、処理部 66 において設定された処理条件で処理され、信号変換部 68 において変換された出力用の画像データとされ、プリンタ 16 に出力され、これを再現したプリントが出力される。

【手続補正 5】

【補正対象書類名】明細書

【補正対象項目名】0076

【補正方法】変更

【補正の内容】

【0076】

ショミレーション画像が表示されると、第 1 処理モードと同様に、オハレータかディスプレイ 20 の表示を見て、焼き直しするコマの検定を行い、必要に応じて、キーホールト 18a に設定された調整キー等を用いて、色、濃度、階調等の調整等（マニュアル補正）を行ふ。

調整の場合はキー補正部 74 に送られ画像処理条件の補正量が算出され、この補正量がパラメータ統合部 76 に送られ、処理部 62 および処理部 66 に設定した画像処理条件が補正され、オハレータによる入力に応じて、ディスプレイ 20 に表示される画像も変化する。

オハレータは、検定 OK と判定すると、キーボード 18a 等を用いて、力強さを行い

、そのコマ(画像)に施す処理が確定する